

REMARKS

Claims 1, 3 and 5 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Applicant's allegedly admitted prior art in view of Harakawa (JP 07-183513) (Translation).

Claims 2 and 4 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Applicant's allegedly admitted prior art and Harakawa (JP 07-183513) (Translation) as applied to claims 1, 3, and 5, above, and further in view of Beinglass et al. (U.S. 5,932,286).

Applicant respectfully submits that the rejection under 35 U.S.C. §103(a) is improper and therefore should be withdrawn. Accordingly, claims 1-4 remain pending for further consideration.

The Rejections under 35 U.S.C. §103(a)

The rejections are respectfully traversed for at least the following reasons.

With respect to independent claim 1, Applicant respectfully submits that applicant's allegedly admitted prior art, Harakawa and Beinglass et al., whether taken singly or combined, do not teach or suggest the claimed combination, including at least "depositing a nitride film on said metal layer by a low-pressure chemical vapor deposition method in a single type chamber to form a hard mask layer, and depositing a nitride film by a low-pressure chemical vapor deposition method in the single type chamber and then etching to form a spacer at a sidewall of the patterned metal layer, the patterned polysilicon layer and the patterned hard mask," as recited in claim 1.

The final official action concedes that applicant's allegedly admitted prior art does not specifically teach depositing the nitride film by a low-pressure chemical vapor deposition, the hard mask and the spacer having the specific thickness as claimed, and the combination of applicant's allegedly admitted prior art and Harakawa fails to show using a single type chamber having a temperature of 600°C to 800°C and a pressure of 1 Torr to 500 Torr.

The final official action goes on to allege that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combination of applicant's allegedly admitted prior art and Harakawa by specifying the type of chamber employed, the pressure, and the temperature as taught Beinglass et al. Applicant respectfully disagrees.

The invention is intended to solve the problem that a lift or a crack is generated in the interface due to the difference in the stress between two types of nitride films, i.e., the nitride film constituting the hard mask and the nitride film constituting the spacer. The lift or crack may contaminate the wafer and the apparatus or may cause contact between the wirings when the device is driven, to degrade electrical characteristics of the device. Further, this phenomenon may significantly affect the throughput of the device since it is severe in an edge of the wafer. The invention provides a method of forming wiring in a semiconductor device capable of preventing a lift or a crack generated when nitride films having different physical properties come in contact, by using a nitride film having similar stress characteristics.

Harakawa and Beinglass et al. do not recognize this problem. Also, applicant's allegedly admitted prior art, Harakawa, and Beinglass et al. do not teach or disclose that the hard mask and the spacer are formed by using a nitride film having similar stress characteristics in order to prevent a lift or a crack generated when nitride films having different physical properties come in contact.

Harakawa does not teach or suggest about using a patterned hard mask to form a patterned metal layer. Referring to the paragraph [0012] of Harakawa, the following is stated: "Etching processing is given as it is shown in drawing 3, using this resist pattern as a mask. That is, using reactive ion etching (RIE) silicon nitride 106 and the tungsten silicide film 105 are processed into a gate electrode configuration, and resist is removed." Thus, Harakawa appears to disclose using the resist pattern as a mask to form the patterned metal

layer. Therefore, it appears Harakawa is not silent about using the patterned hard mask to form the patterned metal layer. Also, Harakawa does not disclose using a patterned hard mask to form a patterned polysilicon layer.

Furthermore, Harakawa does not teach forming a spacer at a sidewall of the patterned metal layer, the patterned polysilicon layer, and the patterned hard mask.

Beinglass et al. does not teach using a patterned hard mask to form the patterned metal layer and the patterned polysilicon layer, and forming a spacer at a sidewall of the patterned metal layer, the patterned polysilicon layer, and the patterned hard mask.

Accordingly, Applicant respectfully asserts that the rejection under 35 U.S.C. §103(a) should be withdrawn because the applied references, whether taken singly or combined, do not teach or suggest each and every feature of independent claim 1. MPEP §2143.03 instructs that "to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. Further, Applicant respectfully asserts that the rejections of dependent claims 2-4 under 35 U.S.C. §103(a) should also be withdrawn at least because of their dependencies upon independent claim 1 and for the reasons set forth above.

With no other rejections pending, Applicant respectfully asserts that claims 1-4 are in condition for allowance.

Formal drawings embodying the correction and new drawings filed January 21, 2003, are in preparation, and will be filed shortly.

Should the examiner wish to discuss the foregoing or any matter of form in an effort to advance this application toward allowance, he is urged to telephone the undersigned at the indicated number.

Respectfully submitted,

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